Classroom Workshop: Energy Sources and Saving Electricity

Objectives:
-Introduce students to the concept of different energy sources and their environmental effects
-Introduce students to the importance of conserving electricity and ways to conserve

Activity 1: Review of Electricity (5 minutes)
Materials: None

Explain: You have been learning a lot about electricity this week. Today, we're going to learn more about where electricity comes from and why saving electricity is important.

Ask: Who here uses electricity? Do we use it a lot or a little? Who can tell me some things that use electricity?

Activity 2: Energy and the Environment (10 minutes)
Materials: white board

Ask: So how do we make electricity? We use **energy** to make electricity. Does anyone know what energy is?

> "Energy makes things move, makes things warm, makes light, and makes things grow. Energy is all around us--in the sun, in the wind, and even in our own bodies! We use many different kinds of energy to make electricity. Making electricity from energy can affect our environment. There are some ways that we make electricity that are clean and do not harm our environment, while there are some ways that are dirty and bad for our environment."

Ask: Raise your hand if you know what our **environment** is! Let's draw our environment. What are some things that are in our environment? (**draw on board**)

-**Draw trees, houses, people, animals, rivers, flowers, schools, etc.**

> "The environment is all around us! We all live in the environment, so it is important that we keep it clean. What kinds of things in the environment do we need to stay alive? What would happen if we didn't keep our environment clean?"

Activity 3: Dirty v. Clean Energy Sources (15 minutes)
Materials: Poster board, Velcro, Laminated Photographs

Ask: Who knows what these are? These are power lines. They bring the electricity to our houses and schools. This house is using a lot of energy. What kind of energy is it using? Every time we use electricity, we have to make more!

Dirty Energy:

Coal: (Velcro on coal plant) "A long time ago, the only way to make electricity was to burn something called fossil fuel. One kind of fossil fuel is called coal. Coal is a black rock with energy inside of it. It was made millions of years ago, when dinosaurs were still roaming the earth! We have to dig underground and under mountains to get it. Then we have to burn the coal to get its energy."

Ask: Do you think that coal is good or bad for our environment?

"When we burn coal, we make yucky smoke that smells bad! Have you even seen dark smoke coming out of a big tower? This is called **pollution**, which makes our air and water dirty. It can make people and animals sick.

Ask: Has anyone here ever heard of asthma? One way that burning coal can make you is by making it harder to breathe the air. This can make it easier to get sick with asthma.

Clean Energy:

"We still use a lot of dirty coal to make our electricity. But now, we have new clean ways to make electricity! With our new clean ways, we don't have to burn anything that could make us sick or hurt our environment. "

Sun: "The sun has a lot of energy- you can feel its energy when you go outside on a hot, sunny day. The sun's energy helps plants grow, keeps us warm, and lets us see where we're going! "

Ask: Who thinks we can use the sun's energy to make electricity?

"We can use the sun's energy to make our electricity with **solar panels**! (**Velcro on solar panels)** Solar panels soak up the sun and make electricity. The sun's energy is a clean way to make electricity!"

Wind: "The wind has energy- it can make things move. It can hold up kites in the air and blow trees back and forth on a windy day. Strong, powerful wind can even knocks trees over during a hurricane!"

Ask: Who thinks we can use the wind's energy to make electricity?

"We can use the wind's energy to make our electricity with wind turbines (**Velcro on wind turbines)**. Wind turbines have blades. The energy in the wind pushes the blades of the turbine and makes it spin. When the turbine spins, it makes electricity! The wind's energy is a clean way to make electricity!"

Ask: If you got to choose which way to make electricity, which would you choose? Where would you put it?

Activity 4: Saving Energy (10 minutes)
Materials: None

"Every time we use electricity, we have to make more. The sun and the wind are clean ways to make electricity, but **half of our electricity** still comes from **dirty coal.** Can anybody tell me why it is important to save electricity?"
"Saving electricity helps keep our environment clean! When we use less electricity, we don't have to burn as much coal, which pollutes our air, and water. Saving electricity also saves us money! Our families have to pay money to use electricity. The less we use, the more money we save!"

Ask: Can anyone think of some ways to save electricity?
-Turn out the lights, turn off TV and video games, turn air conditioning down, and use energy saving light bulbs

Activity 5: Energy Bike (20 minutes + optional time for whole class to try)
Materials: bike generator, light bulbs

Volunteer brings out bike: "Now that we know how electricity is made, we're going to make some electricity ourselves! Remember, electricity is made from energy, and energy is all around us, even in our bodies. The energy in our bodies lets us run, jump, dance, and play. Everybody wiggle your hands. You are using your energy! Today we are going to make electricity the same way that a wind turbine makes electricity. Remember, a wind turbine uses the energy in the wind to spin a magnet. Today, we're going to use the energy in our legs to spin a magnet and make electricity"

Ask: Raise your hand if you think it will be easy to make electricity. Raise your hand if you think it will be hard.
Ask: Which kind of light bulb do you have in your home? Which one do you think uses the most electricity? Let's find out!

Pick two volunteers. Have one volunteer pedal and the other turn on the switches. Start out with CFLs, then move on to incandescents.

Ask: Which one was harder to turn on? So which light bulb uses the most electricity?

"These (CFLs) are special electricity-saving light bulbs. They help save the environment and save money!"

Ask: Which light bulb would you choose if you wanted to save electricity?

Optional: Use bike generator to power boom box or a pencil sharpener
Optional: Let everybody try the bike generator!